

REMARKS

By the present amendment and response, claim 1 has been amended to overcome the Examiner's objections. Claim 2 has been canceled and claims 5-10 and 17-20 have been withdrawn from consideration by the Examiner in the present Office Action, pending future examination and allowance. Reconsideration and allowance of the claims presently considered by the Examiner, i.e. claims 1, 3-4, and 11-16, in view of the following remarks are requested.

The Examiner has objected to the title of the invention as not clearly describing the invention to which the claims are directed. Applicant has amended the title of the invention in response to the Examiner's objection.

The Examiner has objected to the drawings under 37 CFR § 1.83(a) because they fail to show a capacitor as described in the specification. Under 37 CFR § 1.83(a), "[t]he drawing in a nonprovisional application must show every feature of the invention specified in the claims." However, Applicant respectfully submits that "a capacitor" is not recited in any of the claims presently considered by the Examiner, i.e. claims 1-4 and 11-16. Thus, Applicant respectfully submits that the requirements of 37 CFR § 1.83(a) have been met.

The Examiner has rejected claims 1-4 under 35 USC §102(b) as being anticipated by U.S. patent number 6,114,962 to Wiklof et al. ("Wiklof"). For the reasons discussed below, Applicant respectfully submits that the present invention, as defined by amended independent claim 1, is patentably distinguishable over Wiklof.

The present invention, as defined by amended independent claim 1, teaches, among other things, an antenna element situated on a top surface of a laminate substrate and being coupled to a laminate substrate bond pad by a trace on the top surface of the laminate substrate, where the laminate substrate bond pad is coupled to a semiconductor die bond pad by a bonding wire. As disclosed in the present application, the impedance of the antenna element can be adjusted to match the output impedance at the semiconductor die bond pad. As a result, the present invention advantageously allows the input impedance of the antenna element to be adjusted to match the desired output impedance at the semiconductor die bond pad without the use of costly impedance matching circuitry. Moreover, by utilizing a trace on the top surface of the laminate substrate to couple the antenna element to the laminate substrate bond pad, the present invention advantageously achieves flexibility in choosing the location of the antenna element on the top surface of the laminate substrate while maintaining a desirably short bonding wire length.

In contrast to the present invention as defined by amended independent claim 1, Wiklof does not teach, disclose, or suggest an antenna element situated on a top surface of a laminate substrate and being coupled to a laminate substrate bond pad by a trace on the top surface of the laminate substrate, where the laminate substrate bond pad is coupled to a semiconductor die bond pad by a bonding wire. Wiklof specifically discloses integrated circuit 26 mounted in recess 24 in first surface 12 of substrate 10. See, for example, column 4, lines 47-50 and Figure 3 of Wiklof. In Wiklof, antenna 28 is

formed on first surface 12 of substrate 10 and includes bonding pad 29, which is formed at the end of antenna 28 and is coupled to integrated circuit 26 by bonding wire 30. See, for example, column 4, lines 64-67, column 5, lines 7-11, and Figure 2 of Wiklof.

However, Wiklof fails to teach, disclose, or suggest an antenna element coupled to laminate substrate bond pad by a trace. In fact, by forming a bonding pad on the end of an antenna, Wiklof teaches away from connecting the bonding pad to the antenna by a trace.

Additionally, in Wiklof, integrated circuit 26 is mounted in recess 24 in first surface 12 of substrate 10, while antenna 28 is formed on first surface 12. However, Wiklof fails to teach, disclose, or suggest a semiconductor die and an antenna element situated on a top surface of a laminate substrate as required by amended independent claim 1.

For all the foregoing reasons, Applicant respectfully submits that the present invention, as defined by amended independent claim 1, is not suggested, disclosed, or taught by Wiklof. Thus amended independent claim 1 is patentably distinguishable over Wiklof and, as such, claims 3 and 4 depending from amended independent claim 1 are, *a fortiori*, also patentably distinguishable over Wiklof for at least the reasons presented above and also for additional limitations contained in each dependent claim.

The Examiner has further rejected claims 1-4 under 35 USC §102(e) as being anticipated by U.S. patent number 6,534,711 to Richard Stephen Pollack ("Pollack"). For the reasons discussed below, Applicant respectfully submits that the present invention, as

defined by amended independent claim 1, is patentably distinguishable over Pollack.

However, Applicant reserves the right to provide declarations and/or documents under 37 CFR §1.131 to “swear behind” the effective filing date of Pollack.

Subject to Applicant’s reserved right to establish priority of the present invention under 37 CFR §1.131, Applicant submits that in contrast to the present invention as defined by amended independent claim 1, Pollack does not teach, disclose, or suggest an antenna element situated on a top surface of a laminate substrate and being coupled to a laminate substrate bond pad by a trace on the top surface of the laminate substrate, where the laminate substrate bond pad is coupled to a semiconductor die bond pad by a bonding wire. Pollack specifically discloses PCB (printed circuit board) 720 situated on inner surface 706a of base portion 706. See, for example, column 19, lines 60-67, column 20, lines 1-12, and Figure 7A of Pollack. In Pollack, pad 726 on the surface of PCB 720 is coupled to antenna 750 by bond wire 732 and leadframe finger 730f, which is situated on inner surface 706a of base portion 706. See, for example, column 20, lines 5-17, column 21, lines 1-20, and Figure 7D of Pollack. In Pollack, integrated circuit 728 is situated on PCB 720. See, for example, column 20, lines 5-12 and Figure 7D of Pollack.

Thus, in Pollack, since integrated circuit 728 is situated on PCB 720 and antenna 750 is mounted on inner surface 706a of base portion 706, integrated circuit 728 and antenna 750 are not situated on the top surface of the same laminate substrate as required by independent claim 11. In Pollack, pad 726 on the surface of PCB 720 is coupled to antenna 750 by bond wire 732. However, Pollack fails to teach, disclose, or suggest a

lamine substrate bond pad coupled to a semiconductor die bond pad by a bonding wire. In fact, Pollack fails to teach, disclose, or suggest a semiconductor die bond pad or a bonding wire situated on a semiconductor die. For all the foregoing reasons, Applicant respectfully submits that the present invention, as defined by amended independent claim 1, is not suggested, disclosed, or taught by Pollack. Thus amended independent claim 1 is patentably distinguishable over Pollack and, as such, claims 3 and 4 depending from amended independent claim 1 are, *a fortiori*, also patentably distinguishable over Pollack for at least the reasons presented above and also for additional limitations contained in each dependent claim.

The Examiner has further rejected claims 11-16 under 35 USC §103(a) as being unpatentable over Wiklof. For the reasons discussed below, Applicant respectfully submits that the present invention, as defined by independent claim 11, is patentably distinguishable over Wiklof.

The present invention, as defined by independent claim 11, teaches, among other things, first and second semiconductor dies and first and second antenna elements attached to a top surface of a laminate substrate, where a first bonding wire provides an electrical connection between a first substrate bond pad and a semiconductor die bond pad on the first semiconductor die and a second bonding wire provides an electrical connection between a second substrate bond pad and a semiconductor die bond pad on the second semiconductor die. The present invention as defined by independent claim 11 provides similar advantages as the present invention as defined by amended independent

claim 1 discussed above. Additionally, as disclosed in the present application, the first and second antenna elements can be horizontally or vertically polarized. Thus, for example, by horizontally polarizing the first antenna element and vertically polarizing the second antenna element, the present invention can advantageously utilize the first antenna element to capture horizontally polarized radiation and the second antenna element to capture vertically polarized radiation.

In contrast to the present invention as defined by independent claim 11, Wiklof does not teach, disclose, or suggest first and second semiconductor dies and first and second antenna elements attached to a top surface of a laminate substrate, where a first bonding wire provides an electrical connection between a first substrate bond pad and a semiconductor die bond pad on the first semiconductor die and a second bonding wire provides an electrical connection between a second substrate bond pad and a semiconductor die bond pad on the second semiconductor die. As discussed above, Wiklof specifically discloses a single integrated circuit (i.e. integrated circuit 26) situated in recess 24 formed in substrate 10. However, Wiklof fails to teach, disclose, or suggest a second integrated circuit situated on substrate 10. Furthermore, Wiklof fails to teach, disclose, or suggest a motivation for including a second integrated circuit on substrate 10. Moreover, as discussed above, integrate circuit 26 is situated in recess 24 formed in substrate 10 while antenna 28 is situated on first surface 12 of substrate 10. Thus, Wiklof fails to teach, disclose, or suggest even one integrate circuit and an antenna that are situated on the top surface of laminate substrate.

For all the foregoing reasons, Applicant respectfully submits that the present invention, as defined by independent claim 11, is not suggested, disclosed, or taught by Wiklof. Thus independent claim 11 is patentably distinguishable over Wiklof and, as such, claims 12-16 depending from independent claim 11 are, *a fortiori*, also patentably distinguishable over Wiklof for at least the reasons presented above and also for additional limitations contained in each dependent claim.

The Examiner has further rejected claims 11-16 under 35 USC §103(a) as being unpatentable over Pollack. For the reasons discussed below, Applicant respectfully submits that the present invention, as defined by independent claim 11, is patentably distinguishable over Pollack.

As discussed above, Pollack fails to teach, disclose, or suggest a semiconductor die and an antenna element situated on a laminate substrate and a laminate substrate bond pad coupled to a semiconductor die bond pad by a bonding wire. Thus, Pollack fails to teach, disclose, or suggest first and second semiconductor dies and first and second antenna elements attached to a top surface of a laminate substrate, where a first bonding wire provides an electrical connection between a first substrate bond pad and a semiconductor die bond pad on the first semiconductor die and a second bonding wire provides an electrical connection between a second substrate bond pad and a semiconductor die bond pad on the second semiconductor die.

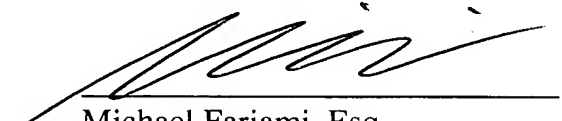
For all the foregoing reasons, Applicant respectfully submits that the present invention, as defined by independent claim 11, is not suggested, disclosed, or taught by

Pollack. Thus independent claim 11 is patentably distinguishable over Pollack and, as such, claims 12-16 depending from independent claim 11 are, *a fortiori*, also patentably distinguishable over Pollack for at least the reasons presented above and also for additional limitations contained in each dependent claim.

Based on the foregoing reasons, the present invention, as defined by amended independent claim 1 and independent claim 11 and claims depending therefrom, is patentably distinguishable over the art cited by the Examiner. Thus, claims 1, 3-4, and 11-16, presently considered by the Examiner, are patentably distinguishable over the art cited by the Examiner. As such, and for all the foregoing reasons, an early allowance of claims 1, 3-4, and 11-16 is respectfully requested.

Respectfully Submitted,
FARJAMI & FARJAMI LLP

Date: 9/18/03

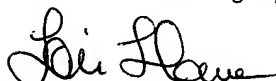

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